

Prevalence of
Activity Limitation
and Arthritis Among
African Americans
in the City of Saint Louis,
Kansas City and the
Bootheel Region of Missouri

Missouri Department of Health

Division of Chronic Disease Prevention and Health Promotion

Office of Surveillance, Research and Evaluation



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PREFACE

The Division of Chronic Disease Prevention and Health Promotion is proud to share with you this report, "Prevalence of Activity Limitation and Arthritis among African Americans in the City of St. Louis, Kansas City and the Bootheel Region of Missouri." This report is the second in a series of monographs dealing with the burden of chronic diseases among minorities in Missouri. It highlights areas of concern related to the human and economic burden of arthritis and the associated challenges for public health in Missouri.

In 1997, the Division established a goal of increasing the number of chronic disease reports available to the public health community of Missouri. This concerted effort of our Office of Surveillance, Research and Evaluation aims to provide critical information to public health professionals working in the chronic disease field for the planning and implementation of health promotion programs in Missouri.

It is our goal to share data and other information available from health assessments and surveillance in order to direct efforts toward improvement of the health status of Missouri citizens we serve. This goal cannot be achieved unless we disseminate this very meaningful information to policy makers, planners, program managers and health professionals throughout the state in a timely manner.

I am pleased to share this report with you and others in the public health community. I look forward to a continuing flow of information from this Division which will help guide and direct our efforts in reaching our vision of "Healthy Missourians in Healthy Communities."

Bernard R. Malone, M.P.A., Director

Division of Chronic Disease Prevention and Health Promotion

I. EXECUTIVE SUMMARY

Surveys of 2,095 adults in the City of St. Louis, Kansas City and the Bootheel region were conducted by the Missouri Department of Health and the Center for Advanced Social Research, University of Missouri-Columbia School of Journalism in 1996 to determine the prevalence of activity limitation and arthritis in these areas. Because there is little information about these conditions among minority populations, these communities were selected due to the high proportion of African Americans living there. Additionally, this study identifies variations by region in the distributions of activity limitation and arthritis among the sociodemographic categories. Survey findings for adults in these areas include the following:

- •Individuals with arthritis have a significantly higher frequency of short- or long-term activity limitation than individuals without arthritis, suggesting arthritis is a significant risk factor for activity limitations.
- •The prevalence of activity limitation is higher in the study areas than the state; however, the prevalence of arthritis is similar in the study areas and the state.
- •The majority of individuals with arthritis are not receiving treatment by a physician.
- •African Americans experience a slightly higher frequency of short- and long-term activity limitation and arthritis than do whites/others.
- •The prevalence of short- or long-term activity limitation is twice as high among African Americans age 18-44 than whites/others in this age group.
- •Individuals who are obese have a higher frequency of short- and long-term activity limitation and arthritis than those who are not obese
- •Individuals with less than a high school education and an annual household income of less than \$15,000 have a higher frequency of short- and long-term activity limitation and arthritis than those with higher levels of education and household income.
- •Racial differences in the prevalence of activity limitation and arthritis disappear when adjusted for income categories.
- •The frequency of short- and long-term activity limitation and arthritis increases with age.
- •Females experience a higher frequency of short- and long-term activity limitation and arthritis than do males.

If the prevalence rates generated in this study are applied to census data, an estimated 9,932 individuals within these three areas currently have a short-term activity limitation and 47,595 have a long-term activity limitation. The estimated number of individuals with definite arthritis is 84,420, of whom 60 percent (50,314 individuals) are not currently receiving treatment by a physician. Based on other research, it is likely that a significant number of residents in the three

areas have arthritis but have not yet been told this by a doctor (i.e., their arthritis remains undiagnosed). For example, eight percent of survey respondents reported that, although they had not been told by a doctor that they have arthritis, they had symptoms that could lead to a diagnosis of arthritis.

These findings suggest that arthritis and other causes of activity limitation are important public health issues for adults living in the surveyed communities. For further information on arthritis and services available through the Missouri Arthritis Program, refer to the Missouri Arthritis Program description at the back of this monograph.

II. INTRODUCTION

Arthritis is the leading cause of disability in the United States, costing an estimated \$64.8 billion annually (Yelin and Callahan 1995). In 1990, an estimated 870,000 Missourians (16.7%) had arthritis (CDC 1994). By 2020, a projected 1,225,000 Missourians (20.0% of the state's population) will have this condition.

African Americans rank arthritis as the top condition which limits major activities such as working, keeping house and living independently (CDC 1996). Additionally, African Americans are more likely than whites to experience higher rates of activity limitation due to arthritis in performing personal care needs and handling daily routine needs (CDC 1996). One purpose of this study was to determine the prevalences of activity limitation and arthritis among African Americans in the three-region study area. Another purpose was to determine the association of arthritis with the need for assistance in personal care and daily routine needs. The final purpose was to examine the association of access to health care (as measured by the possession of health care coverage and cost as a barrier to medical treatment) with these conditions.

Disability associated with activity limitation and arthritis can be ameliorated by early medical care, appropriate treatment (Lorig et al. 1993) and, perhaps, weight control (Felson et al. 1992). Specialized self-help courses and exercise regimes may increase mobility and quality of life for those individuals with activity limitations and arthritis, while decreasing associated health care costs (Lorig et al. 1993). For these reasons, the findings of this study raise important policy issues.



III. METHODS

Sampling and Analysis

The Missouri Department of Health (MDOH), Division of Chronic Disease Prevention and Health Promotion (CDPHP) surveyed 2,095 residents of the City of St. Louis, Kansas City and the Bootheel region (including Dunklin, Mississippi, New Madrid, Pemiscot and Scott counties but not including Stoddard County). Telephone interviews were conducted by CDPHP - Office of Surveillance, Research and Evaluation (OSRE) and the Center for Advanced Social Research (CASR), University of Missouri-Columbia (MU) School of Journalism between May and September 1996. Participants were selected by random-digit-dialing (RDD) techniques (see Appendix A).

By selecting these three regions of the state, investigators made a deliberate attempt to include a large number of African Americans. Sample populations were identified using census data and ZIP codes to target areas in St. Louis City and Kansas City where more than 40% of the residents were African American and areas in the Bootheel region where more than 18% of the residents were African American. Data were weighted to compensate for unequal probability of selection and representation of some elements of the sample population (for example, young men are frequently undersampled in telephone surveys). See Appendix A for additional details regarding study methods.

Investigators generated race- and age-specific prevalence estimates for activity limitation and arthritis across a variety of sociodemographic and other factors. Both activity limitation and arthritis were self-reported by survey respondents.

Variable Definitions

For purposes of this study, data and respondents were categorized as follows:

Age - Respondents were divided into three age groups: those age 18-44; those age 45-64; and those age 65 and older.

Race/ethnicity - Respondents were categorized as African American, white or "other." The "other" group included Asian/Pacific Islanders, Native Americans and Hispanics. Whites and others were analyzed together because of the small number of "other" ethnic/racial respondents and to highlight findings among African Americans.

Educational attainment - Respondents were divided into three groups: those with less than a high school education; those with a high school diploma or General Education Degree (GED); and those with more than a high school education.

Household income - Based on the annual household income, respondents were divided into three groups: those with a household income under \$15,000; those with a household income between \$15,000 and \$24,999; and those with a household income of \$25,000 or more.

Frequency and duration of activity limitation - Respondents were categorized as having an activity limitation if they answered "yes" to the question: "Are you limited in any way in any activi-

ties because of any impairment or health problem?" Those who answered "yes" to this question were then asked: "For how long have your activities been limited because of your major impairment or health problem?" Respondents were categorized as having a "short-term" activity limitation if the limitation had existed for less than one year and a "long-term" activity limitation if the limitation had existed for a year or more.

Frequency of arthritis - Respondents were categorized as having definite, or diagnosed, arthritis, hereafter referred to as arthritis, if they answered "yes" to the question: "Have you ever been told by a doctor that you have arthritis?" Respondents were categorized as having "possible arthritis" if they answered "yes" to the question: "During the past 12 months, have you had pain, aching, stiffness or swelling in or around a joint?" and then answered "yes" to the question: "Were these symptoms present on most days for at least one month?".

Health care coverage - Respondents were categorized as having complete health care coverage if they answered "yes" to the question: "Do you have any kind of health care coverage, including health insurance, prepaid plans such as HMOs or government plans such as Medicare?" and "no" to the question: "Was there a time during the last 12 months when you needed to see a doctor but could not because of the cost?" Respondents were categorized as having partial coverage if they answered "yes" to both preceding questions or if they answered "no" to both preceding questions. Respondents were categorized as having no coverage if they answered "no" to the former question and "yes" to the latter.

Help of others with personal care needs - Respondents were categorized as requiring aid with personal care needs if they answered "yes" to the question: "Are you limited in any way in any activities because of any impairment or health problem?" and also answered "yes" to the question: "Because of any impairment or health problem, do you need the help of other persons with your personal care needs, such as eating, bathing, dressing or getting around the house?"

Help of others with handling routine needs - Respondents were categorized as requiring aid in handling routine needs if they answered "yes" to the question: "Are you limited in any way in any activities because of any impairment or health problem?" and also answered "yes" to the question: "Because of any impairment or health problem, do you need the help of other persons in handling your routine needs, such as everyday household chores, doing necessary business, shopping or getting around for other purposes?"

Receiving treatment for arthritis - Respondents who had been told by a doctor that they have arthritis were categorized as receiving treatment for arthritis if they answered "yes" to the question: "Are you currently being treated by a doctor for arthritis?"

Cartographic Analysis

A cartographic analysis was conducted to examine the spatial distribution of activity limitation and arthritis among African Americans in the three regions (see Appendix B for a detailed description of the methods used and the resulting maps). ZIP codes were selected as the unit of analysis for the majority of maps because they represented the smallest geographic unit of survey data. Due to the small number of cases in some areas, certain ZIP codes were combined to calculate the weighted physical limitation and diagnosed arthritis prevalence rates and estimated at-risk populations. Before ZIP codes were combined, several socioeconomic variables were considered to prevent dissimilar areas from being aggregated. These included percentage of African-American population, percentage of the population classified by the US Bureau of the Census as "poor" or "very poor," percentage of population with no college education, and median rent. On those maps in which ZIP codes were combined, boundaries for combined areas are illustrated with dashes instead of solid lines. A footnote is included to alert the reader of this aggregation.

Three sets of maps were produced, one for each region (see Section VII, page 27 and Appendix B). Each set contains six maps that depict ZIP code geography: the ZIP codes at each study site included in the survey; number of study participants by ZIP code; weighted activity limitation and diagnosed arthritis prevalence rates by ZIP code for people age 18 or older; and estimated number of activity limitation and arthritis cases by ZIP code for people age 45 or older.



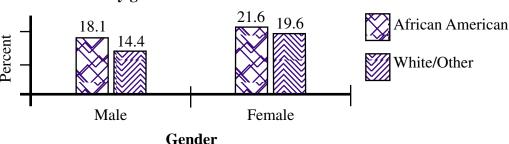
IV. RESULTS

Study participants were mostly African American (63.0%), female (62.5%) and/or age 45 or older (52.3%). The majority of those interviewed had a high school education or less (55.9%) and an annual household income of less than \$25,000 (61.6%)[Table 1].

Activity Limitation (Short- or Long-Term)

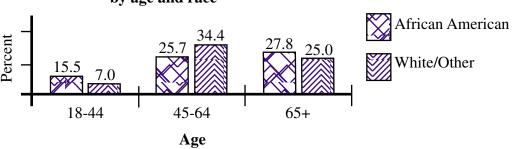
The racial/ethnic distribution of activity limitation, either short- or long-term, was analyzed by gender, age, education, annual household income, health coverage and the presence of arthritis [Table 2]. Importantly, the combined prevalence of short- and long-term activity limitation in the three study areas (19%) was higher than the state prevalence (12.7%) (CDC 1997). For both African Americans and whites/others, females had a higher frequency of activity limitation than did males [Figure 1 and Table 2]. However, this pattern was not present in the Bootheel region, where genders (by race) experienced similar levels of activity limitation (data not shown).

Figure 1. Prevalence of activity limitation, by gender and race



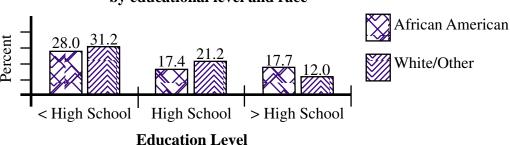
The frequency of activity limitation increased with age [Table 2]. Notably, the prevalence of activity limitation was more than twice as high for African Americans age 18-44 years than similarly aged whites/others [Figure 2 and Table 2].

Figure 2. Prevalence of activity limitation, by age and race



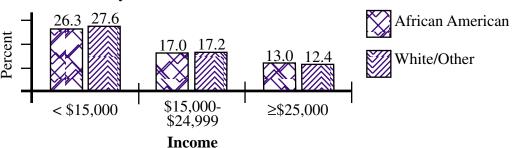
Individuals with less than a high school education were more likely to have an activity limitation than those with a high school diploma or more education [Figure 3 and Table 2]. However, this pattern was not present for whites/others in Kansas City, where individuals with less than a high school education had the lowest frequency of activity limitation (data not shown).

Figure 3. Prevalence of activity limitation, by educational level and race



Individuals with an annual household income of less than \$15,000 had a higher frequency of activity limitation than those with a household income of \$15,000 or more [Figure 4 and Table 2]. In St. Louis, the higher frequency of activity limitation extended to individuals with an annual household income of less than \$25,000 (data not shown)

Figure 4. Prevalence of activity limitation, by annual household income and race



Individuals who are obese had a higher frequency of activity limitation than those who were not obese [Figure 5 and Table 2]

Individuals with complete or partial health care coverage had a slightly higher frequency of activity limitation than those without coverage [Figure 6 and Table 2].

Figure 6.

by level of health care coverage and race

African American

20.7 17.2 20.0 18.1 16.3 14.2 White/Other

Complete Partial None

Prevalence of activity limitation,

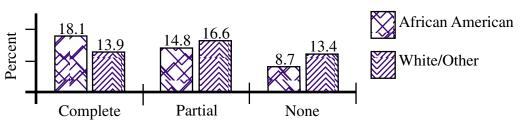
Finally, individuals with definite or possible arthritis had substantially higher frequencies of activity limitation than those without arthritis [Figure 7 and Table 2].

Level of health care coverage

Long-Term Activity Limitation

The ethnic/racial distribution of long-term activity limitation was analyzed by gender, age, level of educational attainment, annual household income, health coverage and the presence of arthritis [Table 3]. For both African Americans and whites/others, females had a higher frequency of longterm activity limitation than did males [Table 3]. However, this pattern was not present in Bootheel region whites/others; among this subgroup, males and females experienced similar levels of longterm activity limitation (data not shown). The frequency of long-term activity limitation was higher among individuals 45 and older than among those younger than 45 [Table 3]. Notably, the prevalence of long-term activity limitation was more than twice as high for African Americans age 18-44 years compared with similarly aged whites/others [Table 3]. Individuals with less than a high school education were more likely to have an activity limitation than those with a high school diploma or more education [Table 3]. However, this pattern was not present for whites/others in Kansas City, where individuals with less than a high school education had a lower frequency of long-term activity limitation than individuals with a high school education (data not shown). Individuals with an annual household income of less than \$15,000 had a higher frequency of long-term activity limitation than those in higher income groups [Table 3]. However, among St. Louis whites/others, individuals with an annual household income of \$15,000-25,000 had the highest frequency of long-term activity limitation (data not shown). The total African-American sample (Figure 8 and Table 3) and whites/ others in St. Louis (data not shown) with complete or partial coverage had a higher frequency of long-term activity limitation than those without coverage. However, this pattern was not present in Bootheel region African Americans.

Figure 8. Prevalence of long-term activity limitation, by level of health care coverage and race

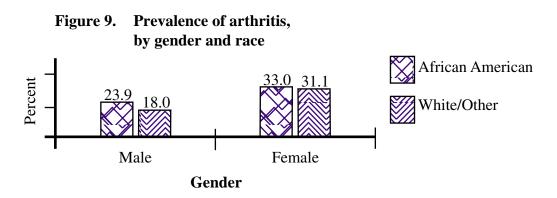


Level of health care coverage

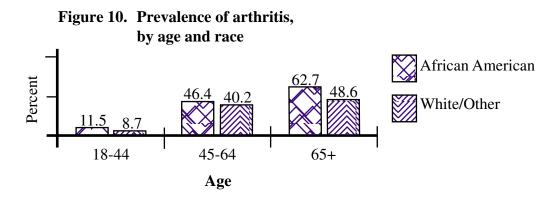
Finally, individuals with definite or possible arthritis had substantially higher frequencies of long-term activity limitation than those without arthritis [Table 3].

Arthritis

The racial/ethnic distribution of arthritis was analyzed by gender, age, level of educational attainment, annual household income, health coverage, the need for aid with personal care and daily routine needs and the presence of activity limitation [Table 4]. The total prevalence of arthritis in the three study areas (27.7%) was similar to the state prevalence (26.3%) (CDC 1997). For both African Americans and whites/others), females had a higher frequency of arthritis than males [Figure 9 and Table 4].

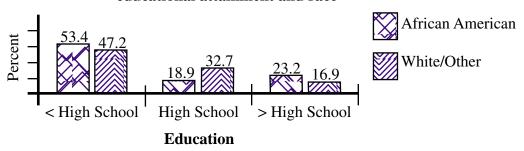


The frequency of arthritis substantially increased with age, with African Americans 65 and older having the highest prevalence [Figure 10 and Table 4]. Notably, St. Louis African Americans age 18-44 years were almost twice as likely to have self-reported definite arthritis than were similarly aged St. Louis whites/others (data not shown).



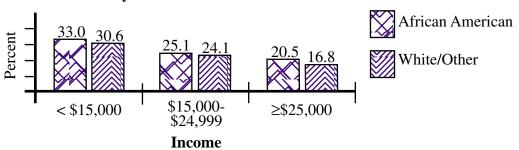
Individuals with less than a high school education were substantially more likely to have arthritis than those with a high school diploma or more education [Figure 11 and Table 4]. However, this pattern was not as pronounced for Bootheel region African Americans and St. Louis whites/others (data not shown).

Figure 11. Prevalence of arthritis by level of educational attainment and race



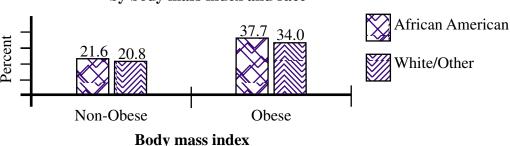
Individuals with an annual household income of less than \$15,000 had a higher frequency of arthritis than those with incomes of \$15,000 or greater [Figure 12 and Table 4].

Figure 12. Prevalence of arthritis, by annual household income and race



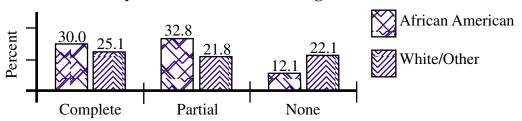
Individuals who were obese had a higher frequency of arthritis than those who were not [Figure 13 and Table 4]. African Americans who were obese had a slightly higher frequency of arthritis than did obese whites/others. However, this patterns were reversed in Kansas City (data not shown).

Figure 13. Prevalence of arthritis, by body mass index and race



Individuals with complete or partial health care coverage had a higher frequency of arthritis than those without coverage [Figure 14 and Table 4]. However, this pattern was not present in Bootheel region African Americans or Kansas City whites/others; for both of these subgroups, the highest frequency of self-reported definite arthritis was found in individuals without health care coverage (data not shown).

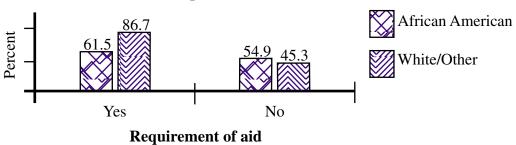
Figure 14. Prevalence of arthritis, by level of health care coverage and race



Level of health care coverage

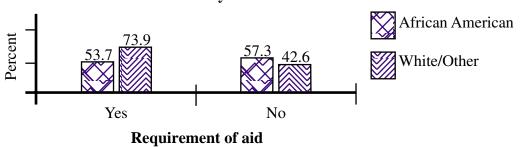
Individuals with arthritis were more likely to require aid with personal care needs than were those without arthritis [Figure 15 and Table 4]. While whites/others were nearly twice as likely to require aid if they had arthritis (89.1% v. 45.3%), among African Americans the difference was much smaller (61.2% v. 55.0%) and the pattern was reversed in African Americans from St. Louis and the Bootheel region (data not shown).

Figure 15. Prevalence of arthritis, by requirement of aid with personal care needs and race



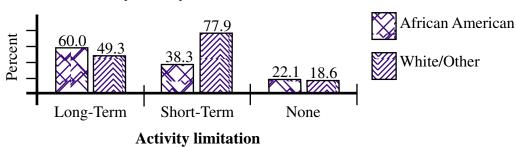
Overall, individuals with arthritis were somewhat more likely to require aid with daily routine needs than those without arthritis (59.7% v. 52.4%) [Table 4] and white/others were significantly more likely to need assistance (73.9% v. 43.0%) [Figure 16]. However, African Americans with arthritis were slightly less likely to need assistance with daily routine needs than those without arthritis (54.1% v. 57.3%) [Figure 16]. It was only among African Americans in Kansas City that a higher frequency of individuals with arthritis who required aid with daily routine needs than those without arthritis was found (data not shown).

Figure 16. Prevalence of arthritis, by requirement of aid with daily routine needs and race



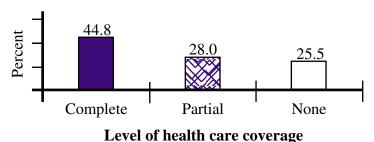
Individuals with a short- or long-term activity limitation had significantly higher frequencies of arthritis than those without an activity limitation [Figure 17 and Table 4], with the exception of Kansas City African Americans, who exhibited similar frequencies of arthritis among individuals with an activity limitation and those without an activity limitation (data not shown). African Americans with arthritis were somwhat more likely than whites/others to experience a long-term activity limitation (60.2% v. 49.3%) while whites others were twice as likely as African Americans to have a short-term activity limitation (77.9% v. 38.1%).

Figure 17. Prevalence of arthritis, by activity limitation and race



Finally, only 40.4% or respondents with arthritis were currently receiving treatment by a doctor for their arthritis [Table 5]. Males, individuals age 18-44 years and those with more than a high school education had significantly lower prevalences of treatment by a physician than did females, individuals age 45 and older and those with a high school education or less. In addition, individuals with partial or no health care coverage were less likely to report current treatment for arthritis than those with complete coverage [Figure 18].

Figure 18. Prevalence of currently receiving treatment by level of health care coverage



There were no differences in treatment by race; 41.0% of African Americans and 39.7% of whites/ others reported receiving treatment currently [Table 5]. However, prevalence of treatment did differ somewhat by region, with St. Louis residents being most likely to report treatment and Boothell residents least likely [Figure 19]. Individuals with a household income under \$15,000 a year were most likely to report treatment for arthritis and those with incomes of \$25,000 and over, least likely. These differences were not statistically significant.

St. Louis Kansas City Bootheel

Location

Figure 19. Prevalence of currently receiving treatment, by study area

Cartographic Analysis

A majority (57.1%) of the population of the City of St. Louis lived within the thirteen ZIP codes sampled, including 92.4% of the city's African-American population (Maps 1 and 2). The ZIP codes with the highest prevalences of activity limitation—63112—and self-reported definite arthritis—63101, and 63147—were located in the western and northeastern sections of the study area (Maps 5 and 6). Based on the prevalence rates, the study area would be expected to contain an estimated 18,842 inhabitants age 45 and older with activity limitation and 37,096 in this age group with self-reported definite arthritis (Maps 5 and 6, respectively).

While the ten ZIP codes sampled in Kansas City contained only 37.4% of the city's total population, they represented a large majority (81%) of the city's African-American population (Maps 7 and 8). The northeastern part of the study site had the highest prevalence of activity limitation—ZIP code 64127—and self-reported definite arthritis—ZIP code 64128—(Maps 11 and 12). In the sampled area, there would be an estimated 14, 395 people age 45 and older with activity limitation and 22, 494 in this age group with self-reported definite arthritis (Maps 11 and 12).

The nine ZIP codes sampled in the Bootheel contained 28.9% of the region's total population, and 61% of the African-American population (Maps 13 and 14). The areas in the central portion of the Bootheel had the highest prevalences of activity limitation—ZIP code 63833—and self-reported definite arthritis—aggregated ZIP codes 63862, 63866 and 63869—(Maps 15 and 16). Based on the prevalence rates, 3,890 residents of the Bootheel ZIP codes sampled who are age 45 and older would be expected to have activity limitation and 6,663 in this age group, self-reported definite arthritis (Maps 17 and 18).

Note: further analyses by region (the City of St. Louis, Kansas City, and the Bootheel) are under way. Results from these regional assessments will be reported separately.

VI. CONCLUSIONS AND RECOMMENDATIONS

Residents of the three region study area (City of St. Louis, Kansas City and the Bootheel Region) have a higher prevalence of activity limitation than the state population. However, the prevalence of arthritis is similar between the study area and the state.

African Americans living in the study area have a slightly higher frequency of activity limitation and arthritis than other racial ethnic groups, including whites and Hispanics, living in the same regions. The disparity in activity limitation and arthritis between the race categories is more pronounced for males than females. African Americans age 18-44 years have greater than twice the frequency of activity limitation than similarly aged whites/others. Additionally, St. Louis, which accounts for 53.2% of the sample, has over twice the frequency of arthritis among African American residents age 18-44 years than is found in similarly aged white/other residents.

Regardless of race, a less than high school education and an annual household income of less than \$15,000 are associated with higher frequencies of activity limitation and arthritis. Although these associations are preliminary, they suggest individuals of lower socio-economic status are more likely to experience these conditions.

The frequencies of activity limitation and (especially) arthritis are higher in individuals with complete or partial access to health care/health coverage. This finding may reflect the cross-sectional method used for data collection and/or a convergence of age-related increases in these conditions concurrent with increased medical coverage in older ages, especially through Medicare. However, this association raises questions as to the "actual" burden of these conditions in the non-covered segment of the study population and perhaps the criteria used in the diagnoses of activity limitation and arthritis.

The presence of arthritis appears to be the primary cause of either short- or long-term activity limitation. Additionally, the majority of individuals with arthritis require some form of aid with either, or both, their personal care and daily routine needs.

Finally, 59.6% of respondents with arthritis are not currently receiving treatment by a physician. However, this percentage is lower than the state percentage (66.3%).

In summary, study findings suggest activity limitation and arthritis are major chronic health burdens that detract from the quality of life for many Missouri residents. These conditions affect all racial/ethnic groups but have a slightly higher frequency of occurrence in African Americans. The notably high frequency of activity limitation, and to a lesser degree arthritis, in African Americans age 18-44 years, when compared to similarly aged whites/others, should be addressed, as should the large percentage of arthritic respondents not under a physician's care. As the population ages in the future, activity limitation and arthritis will become a larger public health problem. Where possible, programs designed to improve the fitness of the public should include elements designed to decrease the risk of activity limitation and arthritis.



Table 1. Unweighted frequency distribution of demographic and selected other factors among respondents in the City of St. Louis, Kansas City and the Bootheel region.

All I	Respondents
-------	-------------

Number	All Respondents
Age 18-44 988 45-64 592 ≥ 65 502 Race African American white/other 1,320 764 Education < high school high school high school 918 470 701 > high school 918 Income < \$15,000 862 \$15,000 24,999 429 ≥ \$25,000 612 Body mass index normal/non-obese 908 1,187 008 008 008 Location St. Louis 989 Kansas City 703 Bootheel 403 703 Bootheel 403 Activity long term 388 limitation short term 67 none 1,608 Arthritis definite 681 possible 165 none 1,238 Health care cowerage partial 371 none 125 1,588 coverage 125	Percent
Age 18-44 988 45-64 592 ≥ 65 502 Race African American white/other 1,320 Education < high school high school	37.5
## African American ## 1,320 ## African American ## 1,320 ## white/other ## 764 ## Education ## African American ## 1,320 ## white/other ## 764 ## Education ## African American ## 1,320 ## white/other ## 764 ## Education ## African American ## 1,320 ## white/other ## 764 ## Education ## African American ## 1,320 ## white/other ## 764 ## Education ## African American ## 1,320 ## 1,3	62.5
Race African American white/other 1,320 Education < high school high school high school	47.2
Race African American white/other 1,320 white/other Education < high school high school high school	28.3
Education < high school high school high school high school > high	24.0
Education < high school high school	63.0
high school 701 > high school 918 Income <\$15,000	36.5
Note	22.4
Income < \$15,000	33.5
\$15,000-24,999 429 ≥ \$25,000 612 Body mass index normal/non-obese 908 Location St. Louis 989 Kansas City 703 Bootheel 403 Activity long term 388 limitation short term 67 none 1,608 Arthritis definite 681 possible 165 none 1,238 Health care complete 1,588 coverage partial 371 none 125	43.8
≥ \$25,000 612	41.1
Body mass index normal/non-obese obese 908 Location St. Louis 989 Kansas City 703 Bootheel 403 Activity long term 388 limitation short term 67 none 1,608 Arthritis definite 681 possible 165 none 1,238 Health care complete 1,588 coverage partial 371 none 125	20.5
St. Louis 989 Kansas City 703 Bootheel 403	29.2
St. Louis 989 Kansas City 703 Bootheel 403	56.7
Kansas City 703 800theel 403	43.3
Bootheel	47.2
Activity long term 388 limitation short term 67 none 1,608 Arthritis definite 681 possible 165 none 1,238 Health care complete 1,588 coverage partial 371 none 125	33.6
Short term	19.2
none	18.9
Arthritis definite 681 possible 165 none 1,238 Health care complete 1,588 coverage partial 371 none 125	3.2
possible 165 none 1,238 Health care complete 1,588 coverage partial 371 none 125	77.9
Health care complete 1,588 coverage partial 371 none 125	32.8
Health care complete 1,588 coverage partial 371 none 125	7.9
coverage partial 371 none 125	59.3
none 125	76.2
A11 101 * 1	17.8
Add with many and	6.0
Aid with personal yes 69	14.3
care needs no 412	85.7
Aid with daily yes 201	41.8
routine needs no 280	58.2

Table 2. Weighted prevalence of short- and long-term activity limitation across demographic and selected other factors among respondents in the City of St. Louis, Kansas City and the Bootheel region.

		Total	African American (percent)	White/ other (percent)
Gender	male	16.6	18.1	14.4
	female	20.9	21.6	19.6
Age ^{1,2}	18-44	12.4	15.5	7.0
	45-64	28.6	25.7	34.4
	≥ 65	26.6	27.8	25.0
Race	African American white/other	20.1 17.1	n/a n/a	n/a n/a
Education ¹	< high school	28.7	28.0	31.2
	high school	18.4	17.4	21.2
	> high school	15.0	17.7	12.0
Income ¹	<\$15,000	26.6	26.3	27.6
	\$15,000-24,999	17.0	17.0	17.2
	≥\$25,000	12.6	13.0	12.4
Body mass index ^{1,2}	normal/non-obese	15.1	15.5	14.7
	obese	24.3	25.1	22.6
Location	St. Louis	20.5	21.1	19.0
	Kansas City	17.3	19.1	14.6
	Bootheel	17.2	13.1	18.7
Arthritis ¹	definite	38.5	39.1	37.8
	possible	43.1	46.7	35.7
	none	7.9	8.0	8.0
Health care coverage	complete	19.2	20.7	17.2
	partial	19.5	20.0	18.1
	none	15.8	16.3	14.2

¹Significant association (p<0.05) between factor and short- and long-term activity limitation. ²Significant association (p<0.05), when controlled for race, between factor and short- and long-term activity limitation.

Table 3. Weighted prevalence of long-term activity limitation across demographic and selected other factors among respondents in the City of St. Louis, Kansas City and the Bootheel region.

	_	Total (percent)	African American (percent)	White/ other (percent)
Gender	male	14.3	15.5	11.7
	female	17.1	17.4	16.6
$Age^{1,2}$	18-44	9.3	11.4	5.5
	45-64	24.3	21.9	29.2
	≥ 65	24.0	26.3	21.2
Race	African American white/other	16.6 14.3	n/a n/a	n/a n/a
Education	< high school	24.1	22.9	27.8
	high school	14.3	14.1	14.9
	> high school	12.8	14.9	10.6
Income	<\$15,000	22.3	22.6	21.4
	\$15,000-24,999	12.5	11.4	15.0
	≥\$25,000	11.4	11.0	12.0
Body mass index	normal/non-obese	12.4	12.9	11.6
	obese	20.3	20.4	20.1
Location	St. Louis	16.6	17.3	14.9
	Kansas City	14.6	15.9	12.6
	Bootheel	15.2	11.0	16.7
Arthritis	definite	32.4	34.4	28.7
	possible	34.1	34.1	34.0
	none	6.5	6.1	7.2
Health care coverage	complete	16.4	18.1	13.9
	partial	15.2	14.8	16.6
	none	9.9	8.7	13.4

¹Significant association (p<0.05) between factor and short- and long-term activity limitation. ²Significant association (p<0.05), when controlled for race, between factor and short- and long-term activity limitation.

Table 4. Weighted prevalence of arthritis across demographic and other selected factors among respondents in the City of St. Louis, Kansas City and the Bootheel region.

		Total (percent)	African American (percent)	White/ other (percent)	
Gender1	male	21.8	23.9	18.0	
	female	32.4	33.1	31.2	
Age1,2	18-44	10.7	11.5	8.7	
	45-64	44.3	46.4	40.6	
	≥ 65	56.8	62.9	48.7	
Race	African American	29.2	n/a	n/a	
	white/other	24.9	n/a	n/a	
Education1,2	< high school	52.1	53.6	47.2	
,	high school	22.7	18.9	32.7	
	> high school	20.4	23.2	16.9	
Income1	< \$15,000	32.5	33.0	30.7	
	\$15,000-24,999	24.8	25.2	24.2	
	≥ \$25,000	18.9	20.6	16.9	
Body mass index 1,2	normal/non-obese	12.4	12.9	11.6	
,	obese	20.3	20.4	20.1	
Location	St. Louis	29.1	31.5	23.1	
	Kansas City	25.1	25.0	24.4	
	Bootheel	30.9	34.2	30.3	
Activity1,2	long term	56.6	60.2	49.3	
limitation	short term	50.8	38.1	77.9	
	none	20.9	22.2	18.6	
Health care	complete	28.2	30.0	25.2	
coverage	partial	30.1	32.9	21.8	
C	none	14.7	12.1	22.1	
Aid with personal	yes	72.6	61.5	89.4	
care needs	no	52.1	55.0	45.3	
Aid with daily	yes	59.7	54.1	73.9	
routine needs	no	52.4	57.3	43.0	

¹Significant association (p<0.05), between factor and arthritis.

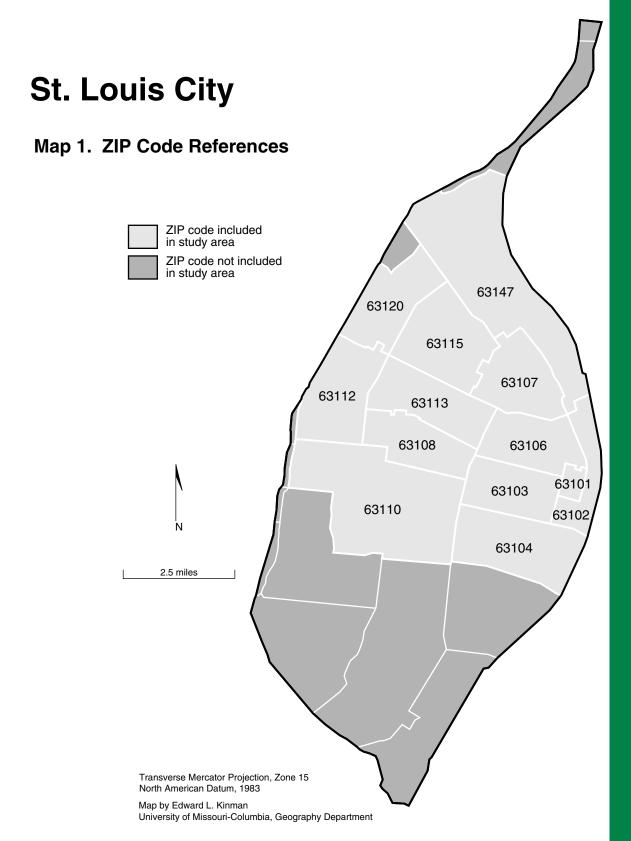
²Significant association (p<0.05), when controlled for race, between factor and arthritis.

Table 5. Weighted prevalence of treatment for arthritis across demographic and selected other factors among respondents in the City of St. Louis, Kansas City and the Bootheel region.

		percent
TOTAL SAMPLE		40.4
Gender ¹	male female	32.1 44.8
Age^1	18-44 45-64 ≥ 65	18.9 41.6 50.9
Race	African American white/other	41.0 39.8
Education ¹	< high school high school > high school	49.7 45.4 26.3
Income	< \$15,000 \$15,000-24,999 ≥ \$25,000	44.1 40.3 32.6
Body mass index ¹	normal/non-obese obese	35.8 43.4
Location	St. Louis Kansas City Bootheel	43.7 37.3 31.5
Health care coverage ¹	complete partial none	44.8 28.0 25.5

¹Significant association (p<0.05), between factor and arthritis.





St. Louis City





St. Louis City Demographics

 Total people 	396,685
White	202,276
African American	187,995
Other	6,414
 People below povert 	y level 95,271
 People 25 years or o 	lder
with no college educ	ation 164,187

Study Area Demographics

I otal people	226,431
White	49,789
African American	173,735
Other	2,907
 People below poverty level 	72.307

People below poverty level
 People 25 years or older with no college education
 72,307
 88,324

Proportion of St. Louis City's population in study area
 57.1%

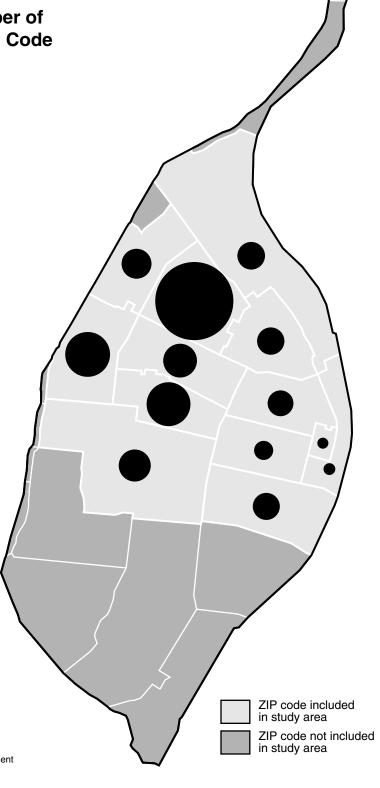
 Proportion of St. Louis City's African-American population in study area
 92.4%

 Proportion of St. Louis City's population below poverty level in study area
 75.9%

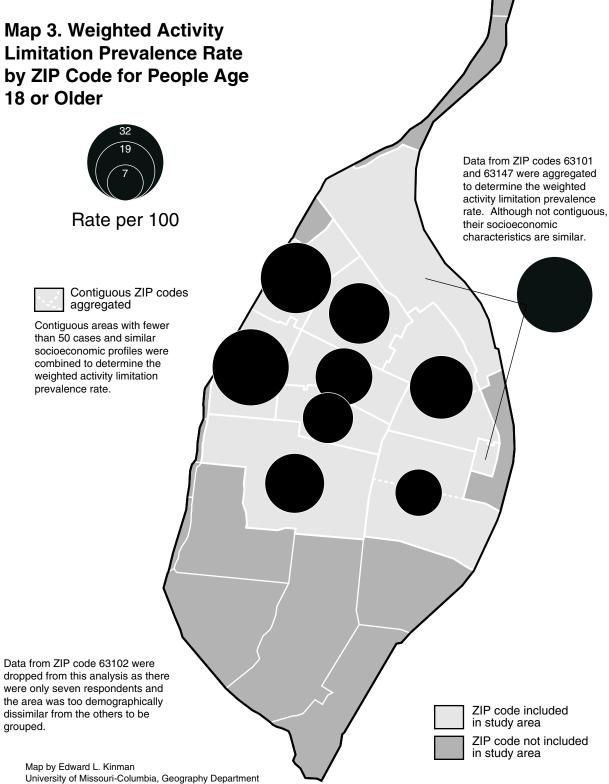
 Proportion of St. Louis City's population 25 years or older with no college education in study area
 53.6%

Source: U.S. Census Bureau, 1990.

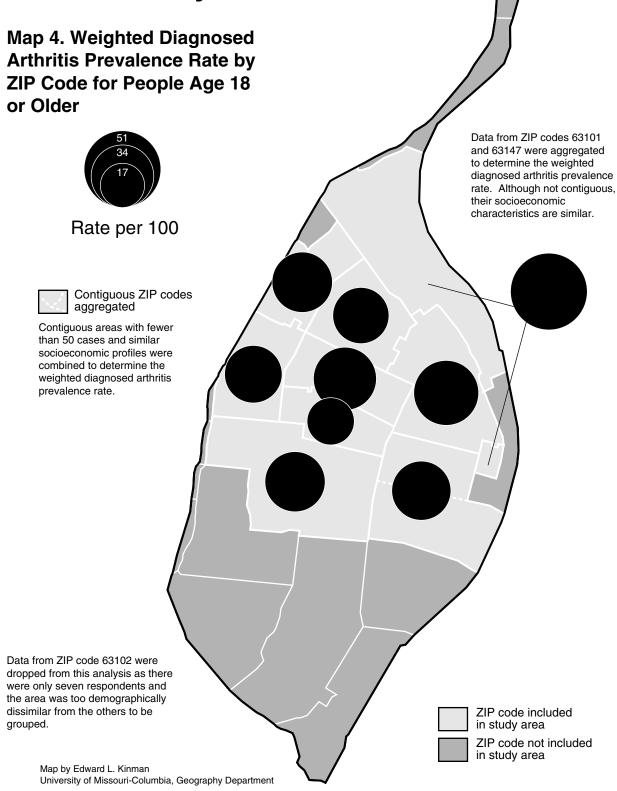
Map by Edward L. Kinman University of Missouri-Columbia, Geography Department



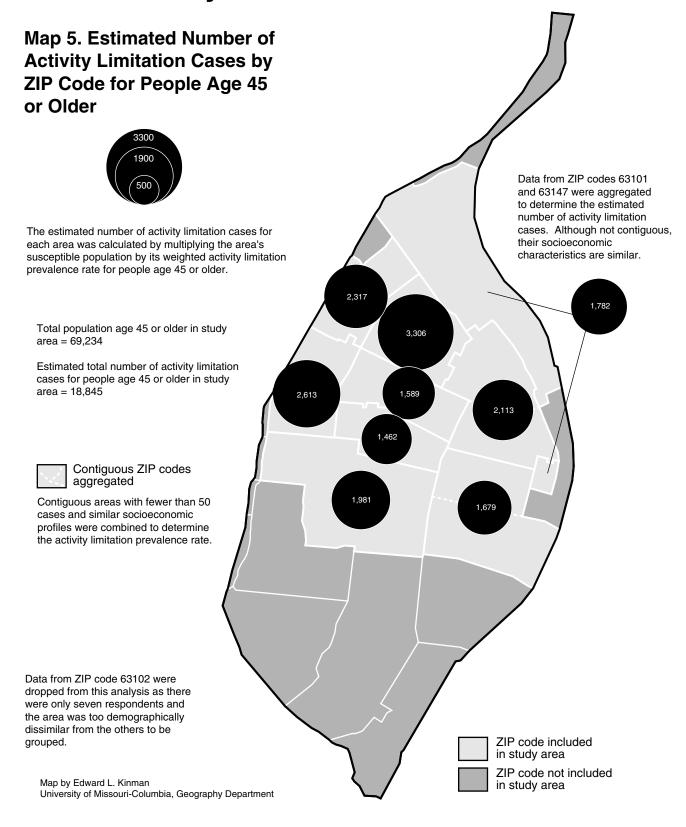
St. Louis City



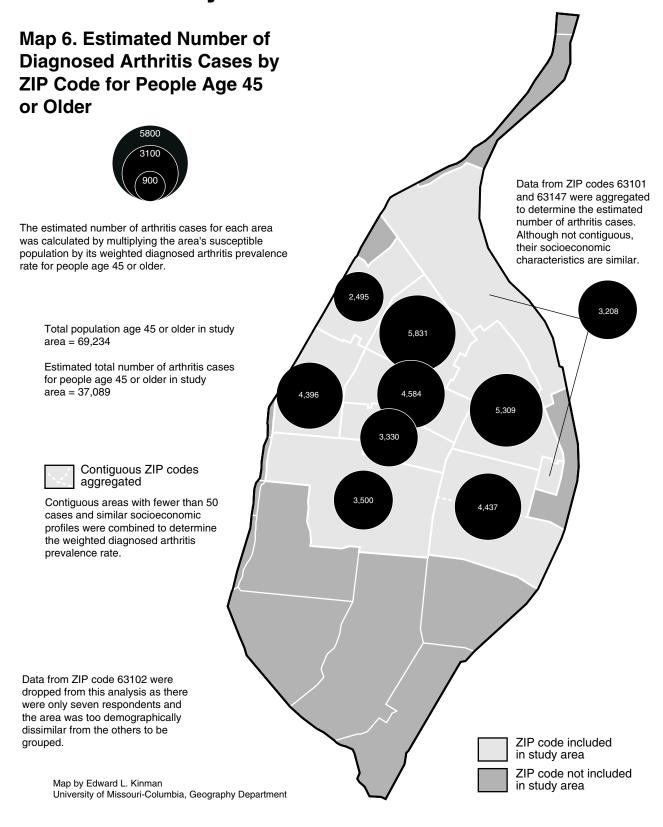
St. Louis City



St. Louis City



St. Louis City



Kansas City Map 7. ZIP Code References ZIP code included in study area ZIP code not included in study area 64105 64106 64108 64127 64109 64128 64110 64130 64132 64131 5 miles Transverse Mercator Projection, Zone 15 North American Datum, 1983 Map by Edward L. Kinman University of Missouri-Columbia, Geography Department

Map 8. Unweighted Number of Study Participants by ZIP Code



Kansas City Demographics

 Total people 	435,141
White	290,898
African American	128,843
Other	15,400
 People below poverty level 	65,381
 People 25 years or older 	
with no college education	146,347

Study Area Demographics

162,590
50,912
105,171
6,507
42,641
62,110

Proportion of Kansas City's

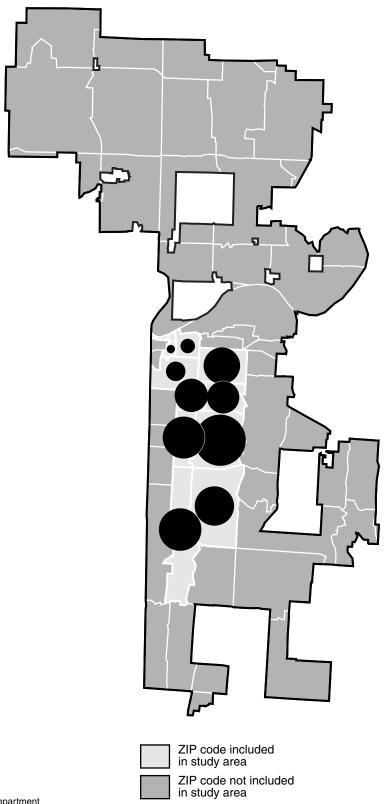
population in study area 37.4%

 Proportion of Kansas City's African-American population in study area
 81.6%

 Proportion of Kansas City's population below poverty level in study area
 65.2%

 Proportion of Kansas City's population 25 years or older with no college education in study area
 42.4%

Source: U.S. Census Bureau, 1990.



Map 9. Weighted Activity Limitation Prevalence by ZIP Code for People Age 18 or Older



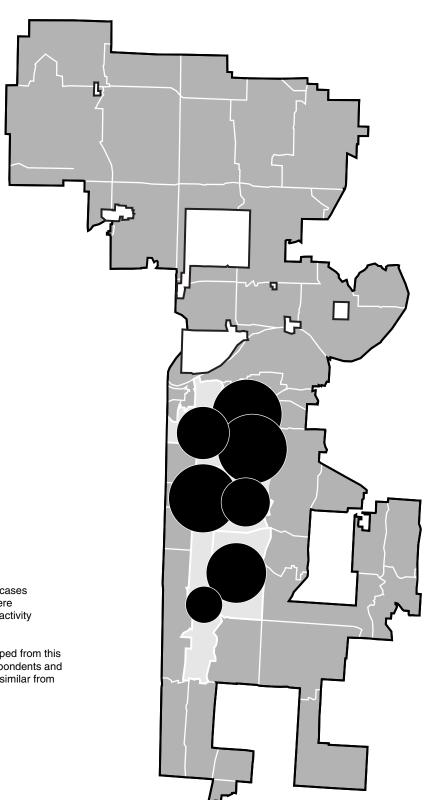
Rate per 100

Contiguous ZIP codes aggregated

Contiguous areas with fewer than 50 cases and similar socioeconomic profiles were combined to determine the weighted activity limitation prevalence rate.

Data from ZIP code 64105 were dropped from this analysis as there were only three respondents and the area was too demographically dissimilar from the others to be grouped.

ZIP code included in study area
ZIP code not included in study area



Map 10. Weighted Diagnosed Arthritis Prevalence by ZIP Code for People Age 18 or Older



Rate per 100

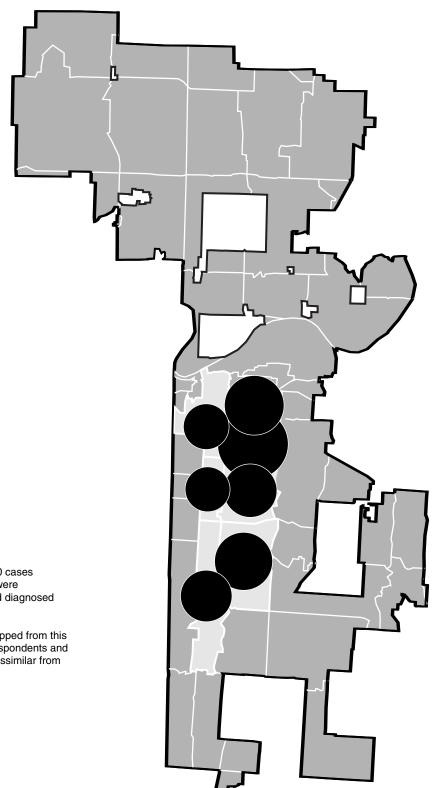
Contiguous ZIP codes aggregated

Contiguous areas with fewer than 50 cases and similar socioeconomic profiles were combined to determine the weighted diagnosed arthritis prevalence rate.

Data from ZIP code 64105 were dropped from this analysis as there were only three respondents and the area was too demographically dissimilar from the others to be grouped.

ZIP code included in study area

ZIP code not included in study area



Map 11. Estimated Number of Activity Limitation Cases by ZIP Code for People Age 45 or Older



The estimated number of activity limitation cases for each area was calculated by multiplying the area's susceptible population by its weighted activity limitation prevalence rate for people age 45 or older.

Total population age 45 or older in study area = 49,285

Estimated total number of activity limitation cases for people age 45 or older in study area = 14,395



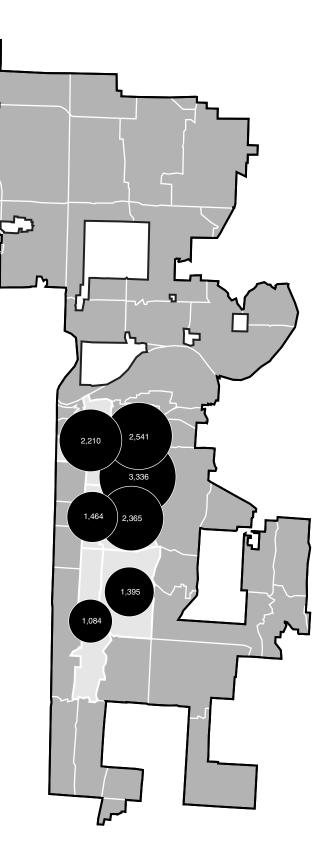
Contiguous ZIP codes aggregated

Contiguous areas with fewer than 50 cases and similar socioeconomic profiles were combined to determine the weighted activity limitation prevalence rate.

Data from ZIP code 64105 were dropped from this analysis as there were only three respondents and the area was too demographically dissimilar from the others to be grouped.

ZIP code included in study area

ZIP code not included in study area



Map 12. Estimated **Number of Diagnosed Arthritis Cases by ZIP Code for People Age** 45 or Older



The estimated number of arthritis cases for each area was calculated by multiplying the area's susceptible population by its weighted diagnosed arthritis prevalence rate for people age 45 or older.

> Total population age 45 or older in study area = 49,285

Estimated total number of diagnosed arthritis cases for people age 45 or older in study area = 22,493

Contiguous ZIP codes aggregated

Contiguous areas with fewer than 50 cases and similar socioeconomic profiles were combined to determine the weighted diagnosed arthritis prevalence rate.

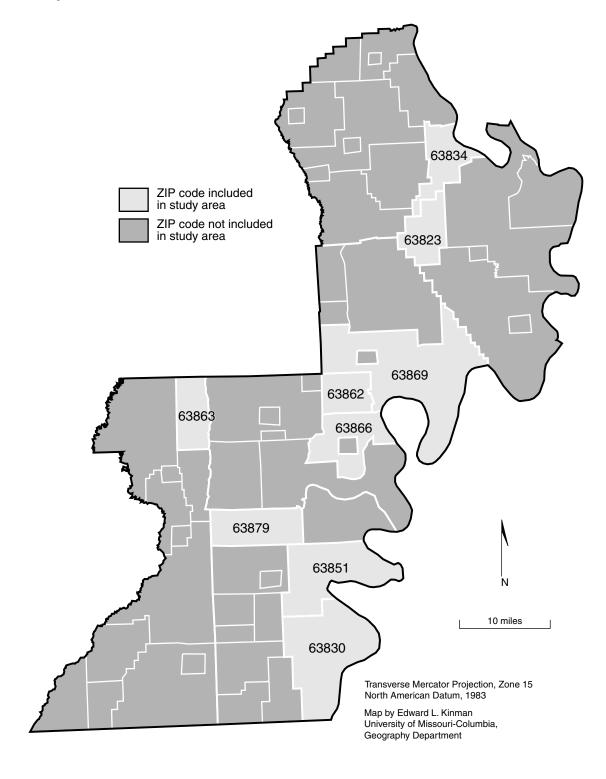
Data from ZIP code 64105 were dropped from this analysis as there were only three respondents and the area was too demographically dissimilar from the others to be grouped.

ZIP code included in study area

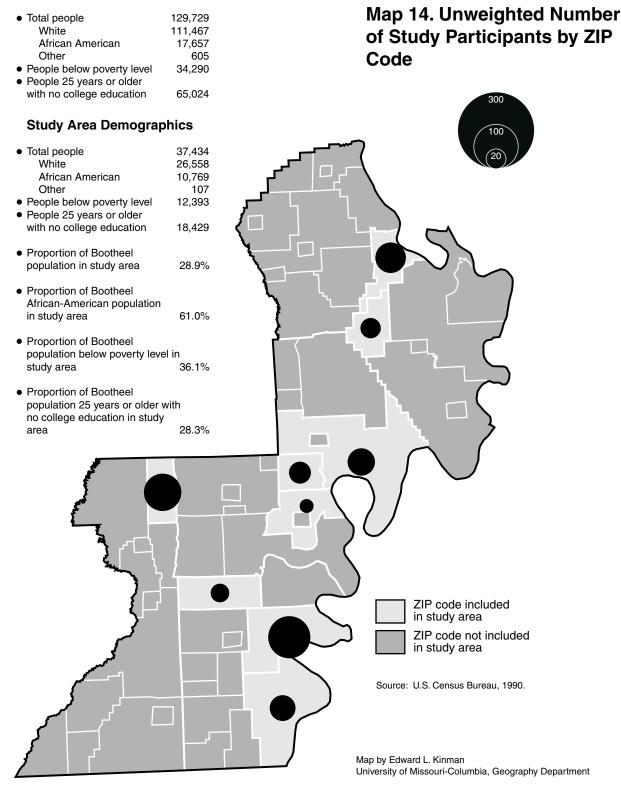
ZIP code not included in study area

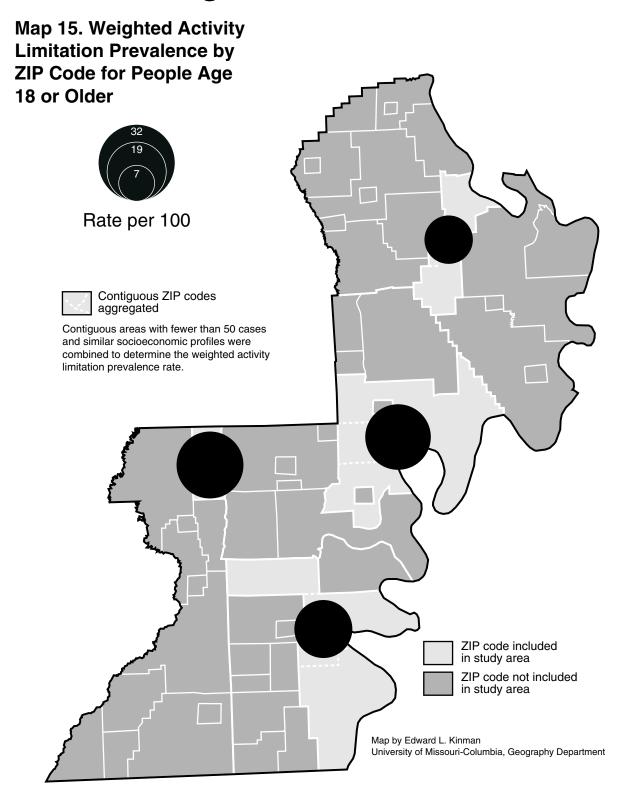


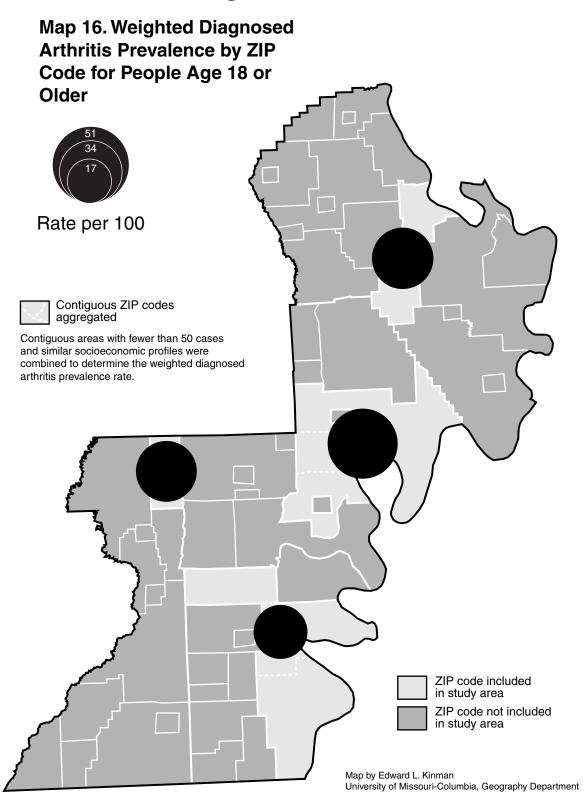
Map 13. ZIP Code References

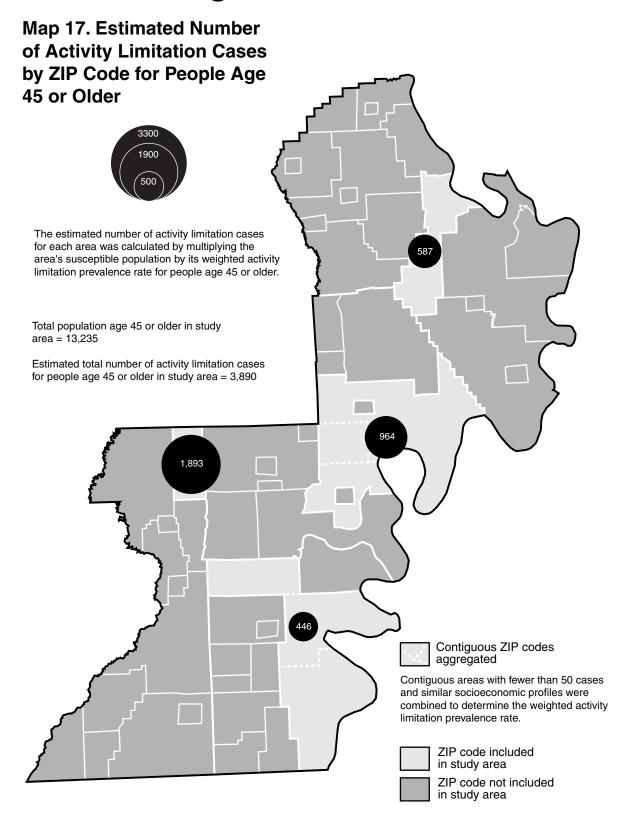


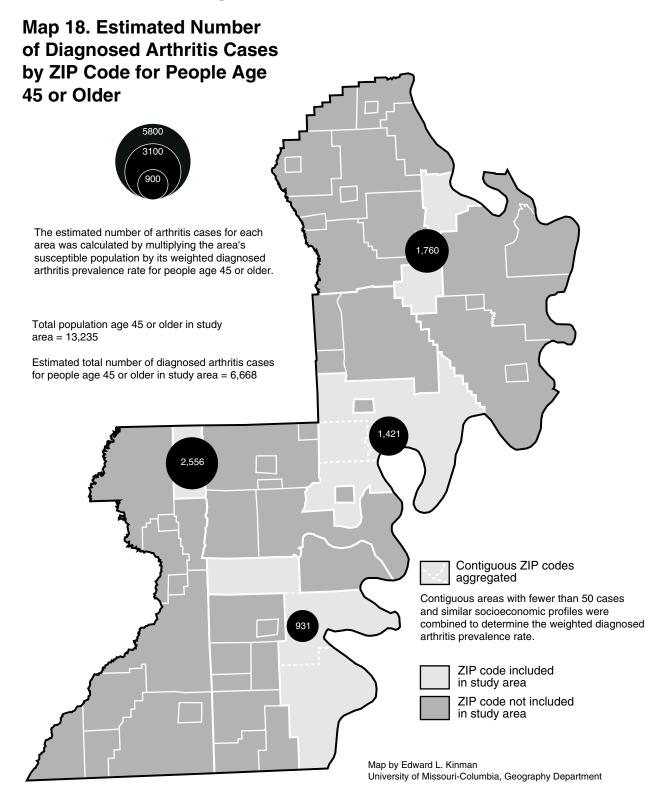
Bootheel Region Demographics











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Appendix A Detailed Description of Sample Methodology

Sampling

Using random-digit-dialing (RDD) techniques, the Missouri Department of Health (MDOH), Division of Chronic Disease Prevention and Health Promotion (CDPHP), Office of Surveillance, Research and Evaluation (OSRE) and the Center for Advanced Social Research (CASR), University of Missouri-Columbia (MU) School of Journalism, sampled 2,095 individuals from specific ZIP codes in the City of St. Louis, Kansas City and the region in the extreme southeastern part of the state known as the "Bootheel."

CASR provided a 1990 census data listing of households and respective telephone numbers in St. Louis. A list purchased from a commercial phone bank firm, R.L. Polk Inc., provided full address and household telephone numbers for the Kansas City area. Based on the proportional representation of African Americans, ZIP codes were selected in these two areas with a 40% or higher African-American population. The selected ZIP codes were cross-tabulated with telephone prefixes using these lists. A combination of area code and prefixes was then used to generate the original list of telephone numbers available for sample, after elimination of prefixes occurring at lower frequency per ZIP code (twenty or less).

The sampling strategy varied by region. For the majority of interviews conducted by OSRE in selected ZIP codes in the City of St. Louis and Kansas City, a two-stage modified Mitofsky-Waksberg sampling frame was used (Groves et al. 1988). A generated random sample of possible telephone numbers were first screened to obtain stage one numbers (area code + prefix + suffix). If the stage one number was determined to be a working, residential telephone number, ninety-nine additional numbers having the same first eight digits (three-digit area code + three-digit prefix + first two digits of the suffix) were generated. This set of 100 numbers constituted the primary sampling unit (PSU) or cluster. Either three or four interviews per cluster were expected in the City of St. Louis and ten interviews per cluster in Kansas City. Additional interviews in both the City of St. Louis and Kansas City were obtained using a simple random sampling frame. Based on the telephone prefixes previously identified, all possible telephone numbers for the areas were generated. After elimination of numbers duplicated through cluster sampling, individual telephone numbers were randomly dialed until a predetermined number of interviews had been completed.

For the Bootheel region, CASR used a two-stage cluster sampling technique similar to the above and stratified by two sets of ZIP codes. For another smaller set of telephone numbers in selected ZIP codes of Kansas City, CASR used a simple random sample technique as described above.

Once a telephone number was selected, computer-assisted telephone interviewing (CATI) was implemented. CATI allows for random selection of eligible respondents within a household while maintaining the integrity of planned design by keeping actual versus expected number of interviews per cluster more or less constant. It also allows for standardization in the number of callbacks. For the CASR samples, the CATI system also

allowed for an equally likely representation of males and females and older and younger respondents as well as minimum within-sampling-unit non-coverage error.

After excluding from further analyses observations with missing, mappropriate or non-response values for variables included in the analysis, the analytical samples presented ranged from 479 to 2,077, depending on the variables being cross-tabulated. Household income had more observations excluded from analysis than any other variable; 194 respondents (9.3% of the total sample) either did not know their household income or refused to provide the information. For most variables, missing, inappropriate or non-response values led to the exclusion of fewer than 20 responses (less than 1.0%).

Analysis

Data were weighted to compensate for unequal probability of sampling selection as a function of stratification, clustering, unequal number of unique telephone number and adults per household. The data were also weighted to compensate for unequal representation of the source population according to gender, race and age (post-stratification). This weighting also minimized non-response and non-coverage, which are differential across those groups defined by gender, age and race.

Prevalence estimates were generated for sociodemographic elements (gender, age, race, education level, household income and location of residence); activity limitation; duration of activity limitation; self-reported definite arthritis; possible arthritis; access to health care (possession of some form of health care coverage and cost as a barrier to a visit to the doctor); aid with personal care and daily routine needs; presence and duration of joint pain; type of arthritis; and other chronic disease-related factors. Race- and age-specific prevalence estimates and 95% confidence interval (95% C.I.) of self-reported activity limitation and arthritis across levels of sociodemographic elements. access to health care and other chronic disease-related factors were generated.

Sample Description

The sample respondents were mostly individuals age 45 or older (52.2%), female (62.5%), African American (63.0%), with a high school education or less (55.9%) and/or with an annual household income of \$15,000 or less (41.1%). The sample has an almost proportional representation of the surveyed areas (City of St. Louis, Kansas City and the Bootheel region).

Weighted frequencies minimized some of the above-noted differences by race, gender, age, education, income and region. However, these differences remained after weighting and the distribution closely resembles the 1990 census information on these subsegments of the population.

Limitations of the Study

Data for this study were collected through telephone interviews with adult (18 years of age and older) residents of the three study areas. As a result, adult residents without access to a residential telephone had no opportunity to be considered during the random selection process.

In order to obtain additional information, face-to-face interviews were conducted in one ZIP code — 63115 — in St. Louis. These results will be reported elsewhere. Residents of ZIP code 63115 were oversampled in the telephone survey so that comparisons could be made between the face-to-face and telephone interview results. These results will also be reported separately.

This analysis was conducted using cross-sectional data, i.e. data on the disease or condition of interest was collected at the same time that information about factors that might be associated with the presence or absence of the disease/condition, such as age or race, was collected. Given the limitations of cross-sectional data, the results and conclusions presented in this study represent associational relationships, not cause and effect relationships. The delineation of cause and effect is not possible using this study's cross-sectional data set.

Cautionary Note

Although results, discussion and conclusions are focused on differences that are large and unlikely to be affected by random variation, the absence of confidence intervals makes it difficult to generate definitive conclusions on this preliminary report. To that end, a more detailed manuscript is being prepared.

Appendix B Cartographic Analysis

Cartographic analysis is a key component in understanding the nature and extent of health problems for defined geographic areas (Earickson et al. 1989; Meade et al. 1988; Ricketts et al. 1994 Lear month 1988). This appendix describes the methods of automated map production and analysis of study variables. Objectives are to:

- examine the spatial distribution of activity limitation and arthritis cases among African Americans in selected sites;
- compare how each site reflects the broader socioeconomic context of the region;
- analyze the spatial distribution of activity limitation and arthritis prevalence rates by ZIP code at each site; and
- compute and map the estimated number of activity limitation and arthritis cases by ZIP code at each site.

Hardware, Software and Type of Map Used

The maps for this project were produced with Adobe Illustrator, a leading microcomputer-based, computer-assisted design program, on a WindowsNT workstation. The type of quantitative thematic map used in this report illustrates clearly the relative magnitudes of phenomena by geographic location. Proportional symbol maps use varying symbol sizes from place to place in accordance with quantities they represent. Proportional symbols can represent additive totals or derived ratio data. This technique also was chosen because it displays quantitative detail better at the scales employed in the maps than other techniques.

Spatial Units and Boundary Files

The City of St. Louis sample was drawn from twelve contiguous ZIP codes that varied considerably in area and population (one ZIP code included in the study was excluded from cartographic analysis) (see Map 3). St. Louis ZIP codes ranged in size from 0.86 to 17.6 square kilometers and in population from 733 to 30,427. The Kansas City sample was obtained from nine contiguous ZIP codes, ranging in area from 4.2 to 25.1 square kilometers and in population from 7,048 to 30,330. In contrast to these urban sites, only a few Bootheel ZIP codes were contiguous. The nine sampled ZIP codes from this predominately rural region varied in size from 96.1 to 440.7 square kilometers and in population from 1,019 to 8,408

A word of caution concerning the use of ZIP code boundaries for spatial aggregation is appropriate. ZIP codes represent an imposed, arbitrary boundary and do not necessarily reflect the natural distribution of the data collected. In the City of St. Louis and Kansas City, ZIP codes represent relatively large spatial areas for purposes of geographic analysis. This type of aggregation can mask variance.

City of St. Louis

The twelve sampled City of St. Louis ZIP codes are contiguous; this reflects the concentration of the area's African-American population (Map 1). The total number of study participants was 982, with the number of cases per ZIP code ranging from six (ZIP code 63101) to 375 (ZIP code 63115) (Map 2). A majority (57.1%) of St. Louis's population lives in the study area as well as a large majority of the city's African-American population (92.4%). The study area contains 75.9% of the city's population living below the poverty level, considerably higher than the area's base population. By contrast, the proportion of the city's population 25 years or older with no college education is slightly lower than would be expected at 53.6%.

Several ZIP codes had fewer than fifty cases, the minimum number needed to calculate stable rates Therefore, maps portraying the weighted prevalence and estimated number of cases contain graduated circles for nine areas instead of the twelve sampled (Maps 3 through 6). ZIP codes with the highest rates were in the western and northern sections of the city (Map 3). ZIP code 63112, with a rate of 32, had the highest activity limitation prevalence. ZIP code 63120 and the combined ZIP codes of 63147 and 63101 also were high, with rates of 27.3 and 27.9 respectively. For arthritis, most ZIP codes had weighted prevalence rates between 28 and 36, with one notable exception (Map 4). With a rate of 51.2, the combined ZIP codes of 63147 and 63101 not only had the highest diagnosed arthritis rate in St. Louis, but of all ZIP code areas in the study.

The estimated number of activity limitation cases among St. Louis study area residents age 45 and older is 18,845, representing 27.2% of the population in this age group (Map 5). A majority of estimated cases (52.1%) are in the northwestern part of the study area in ZIP codes 63112, 63113, 63115 and 63120. Map 6 shows that 37,089 adults are estimated to have diagnosed arthritis, representing a majority (53.6%) of people age 45 or older. The contiguous area comprised by ZIP codes 63115, 63113, 63107 and 63106 accounts for 42.4% of the estimated diagnosed arthritis cases.

Kansas City

Ten Kansas City ZIP codes were sampled (Map 7). Like the City of St. Louis, all Kansas City ZIP codes are contiguous, which reflects the clustering of the city's African-American population. The total number of survey participants was 700, with the number of cases by ZIP code ranging from 11 (ZIP code 64106) to 158 (ZIP code 64130) (Map 8). While sampled ZIP codes included contain only 37.4% of Kansas City's total population, they represent a large majority of the city's African-American population (81.6%). The study area contains 65.2% of the city's population living below the poverty level, which is almost twice as high as the area's base population. In addition, the study area contains over 40 percent (42.4%) of Kansas City's population 25 years or older with no college education.

Just as in the City of St. Louis, there were several ZIP codes with fewer than fifty cases. Consequently, maps contain graduated circles for seven areas instead of the nine ZIP codes sampled (Maps 9 through 12). With rates of 26.6 for ZIP code 64127 and 26.3 for ZIP code 64128, the northeastern part of the Kansas City study area has the highest activity limitation prevalence rates (Map 9). ZIP code 64110, located in the northern half of the study area, also had a relatively high rate of 25.6. For diagnosed arthritis, the northeastern section of sampled Kansas City ZIP codes again had the highest prevalence, with rates of 43.3 for ZIP code 64128 and 30.9 for ZIP code 64127.

The estimated number of activity limitation cases among Kansas City study area residents age 45 or older is 14,395, representing 29.2% of the population in this age group (Map 11). Of this estimated number, the three northeastern ZIP codes of 64127, 64128, and 64130 contain 8,242 cases, or 57.3% of the Kansas City study area total. Map 12 shows an estimated 22,493 cases of diagnosed arthritis, representing 45.6% of the study area's population age 45 or older. The 11,413 cases from the northeastern sampled ZIP codes of 64127, 64128 and 64130 again account for over half (50.7%) of the estimated arthritis cases. In addition, a large number of diagnosed arthritis cases are found in ZIP code 64131.

Bootheel Region

In the Bootheel, nine ZIP codes from Dunklin, Mississippi, New Madrid, Pemiscot and Scott counties were sampled (Map 13). Unlike the City of St. Louis and Kansas City, the ZIP codes from this region are not all contiguous, reflecting the dispersed nature of African Americans throughout the Bootheel region. The total number of participants from this area was 403, with the number of cases by ZIP code ranging from ten (ZIP code 63866) to 106 (ZIP code 63851) (Map 14). Differences in the number of respondents among ZIP codes generally reflect population variation among ZIP codes. Sampled ZIP codes contain 28.9% of the Bootheel's total population and 61% of the region's African-American population. This disproportionate sampling was intended. The study area contains 36.1% of the region's population living below the poverty level, which is also higher than expected given the area's base population. By comparison, the proportion of the Bootheel population 25 years or older with no college education is close to expected at 28.3%.

Bootheel regional maps depicting estimated prevalence and number of cases only display data for four graduated symbols as most ZIP codes had fewer than fifty cases (Maps 15 through 18). With a rate of 23.3, ZIP code 63863 had the highest activity limitation prevalence of sampled Bootheel areas (Map 15). The combined area containing ZIP codes 66862, 63866 and 63869 had the second highest rate with 22.4. For diagnosed arthritis, a rate of 41 from the combined ZIP codes 63862, 63866 and 63869 was the highest prevalence in the Bootheel (Map 16). With an aggregate rate of 30.9, the Bootheel region had the highest arthritis prevalence of the three study areas, with the City of St. Louis and Kansas City reporting rates of 29.1 and 25.1, respectively.

The estimated number of activity limitation cases in the Bootheel study area is 3,890, representing 29.4% of adults age 45 or older (Map 17). Nearly half (48.6%) of this total is found in ZIP code 63863, with 1,893 estimated cases. The remaining three areas have between 446 and 964 cases. Map 18 shows an estimated 6,668 cases of diagnosed arthritis, representing 50.4% of the population age 45 or older. ZIP code 63863 contains the largest number of people arthritis afflicted people, with 2,556 estimated cases.

What is Arthritis?

Arthritis refers to more than 100 different diseases that cause pain, swelling and limited movement in joints and connective tissue throughout the body. Specific causes for arthritis are not yet known for most forms of the disease. The disease process also varies depending on the form. The three most prevalent forms are osteoarthritis (OA), fibromyalgia and rheumatoid arthritis (RA). Osteoarthritis is a degenerative joint disease in which the cartilage that covers the ends of bones in the joint deteriorates, causing pain and loss of movement as bone begins to rub against bone. In fibromyalgia, widespread pain affects the muscles and attachments to the bone. Rheumatoid arthritis is an autoimmune disease. In RA, the joint lining becomes inflamed as part of the body's immune system activity. The chronic inflammation causes deterioration of the joint, pain and limited movement.

Missouri Arthritis Program

The Missouri Arthritis Program was established by Missouri Statue in June 1984 (RSMo Section 192.700). The mission is to promote optimal health status and quality of life for all Missourians affected by arthritis or other rheumatic conditions through early intervention, education, service and collaboration. The Missouri Arthritis Program has a network of seven Regional Arthritis Centers which provide programs and services to professionals, individuals with arthritis, their families and the general public. Continuing education courses are offered for health professionals. Disease management courses and resources for people with various forms of arthritis are offered, including free literature, loan libraries, in some cases an assistive device loan closet, individual counseling, newsletters, support groups and exercise and self-help courses. Public forums, health fairs and general presentations are part of the Arthritis Program general public awareness activities.

Reducing Impact

- ☐ Maintaining appropriate weight can reduce the risk of developing hip and knee osteoarthritis.
- ☐ Avoiding injuries from sports activities, accidents or repeated motions on the job can reduce your risk for osteoarthritis.
- Seeking early treatment can help intervene in the disease process before damage is severe and possibly slow its progression.
- ☐ Participation in disease management self-help and educational programs can reduce the impact of arthritis and improve the quality of life of people with arthritis.

Additional arthritis information may be obtained by contacting your local Regional Arthritis Center or the Bureau of Chronic Disease Control. (A listing of centers and contacts may be requested at the number listed below)

CONTACT: Mary Ellen Ankeney, Manager (573) 876-3207 (800) 316-0935



Missouri Department of Health

Division of Chronic Disease Prevention and Health Promotion

Office of Surveillance, Research and Evaluation



